The Development of Intrinsic Motivation for Physical Activity

by

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<u>ABSTRACT</u>

The Development of Intrinsic Motivation for Physical Activity

by

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Being physically active can improve a person's health and mental well being. A physically active society could reduce the nation's cost of caring for the preventable diseases associated with the sedentary lifestyles. Some social psychologists have proposed that people who are more intrinsically motivated are more likely to maintain physical activity at a level that is beneficial for their health. Having found this to be so, it is worthy of researchers' efforts to determine the constructs that will move individuals to become more intrinsically motivated to engage in regular exercise and/or physical activity.

This paper will present theories and research related to exercise motivation, and develop implications for practitioners to use in the development of activity and exercise programs. The relevant theories that can be used to understand the adoption and maintenance of regular physical activity include self-determination, cognitive evaluation, self-efficacy, and flow. Through the application of the constructs of these theories within the framework of the Transtheoretical Model practitioners can help individuals to become more active. The adoption of more active lifestyles will allow our nation to have a more productive economy and our citizens to enjoy a better quality of life.

<u>OUTLINE</u>

INTRODUCTION

Many benefits are derived from regular physical activity (Bouchard, Shepard, & Stevens, 1994; U.S. Department of Health and Human Services [USDHHS], 2000, 2004). Physical activity affects many aspects of health, including reducing the risk of contracting debilitating diseases such as Type II diabetes, osteoporosis, colon cancer, and hypertension (Bouchard et al., 1994; USDHHS, 1996, 2000), and experiencing heart attacks and strokes (USDHHS, 2004). Additionally it has been shown to improve the quality of one's life by reducing those ailments that affect a person's ability to effectively cope with the stresses of life, such as depression and anxiety (USDHHS, 1996, 2000, 2004). The positive effect of physical activities on preventing the second leading cause of death in the United States, coronary heart disease, makes it a particularly important subject for researchers to study and the American public to understand (USDHHS, 2000). Despite the growing evidence regarding the positive effects that even moderate physical activity will have on human health, nearly 60% of all adult Americans don't engage in sufficient amounts of physical activity to reap the many benefits it can provide (USDHHS, 2004). What's worse, 40% of all Americans over the age of 18 engage in no leisure-time physical activities (USDHHS, 2000).

In response to the mounting evidence that the health of the United States was rapidly decreasing and research on the positive affects of moderate physical activity, the Surgeon General's issued a report on Physical Activity and Health (USDHHS, 1996). In his report he sounds the alarm for the citizens of the United States to adopt a more active and healthy lifestyle and asserts, "The effort to understand how to promote more active lifestyles is of great importance to the health of the nation" (pg. 11). The Centers for Disease Control has taken the Surgeon General's warning to the action stage with their publication of the Healthy People 2010

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initiative. In this document they establish a simple yet encompassing goal for the people of the

United States to "improve health, fitness, and quality of life through daily physical activity"

(2000, pg. 1). Through a myriad of initiatives implemented within the nation's education

system, publicly funded community recreation centers, community planning and development

boards, and private industry, they hope to stimulate the motivation for more Americans to adopt

regular exercise routines (USDHHS, 2000).

The purpose of this paper is to present theories and research related to exercise motivation

and develop implications for management. The relevant theories that can be used to understand

the adoption and maintenance of regular physical activities include: Self-Determination (Deci &

Ryan, 1980) and Cognitive Evaluation (Deci & Ryan, 1985), Continuum of Motivation model

(Deci & Ryan, 1991), Self-Efficacy (Bandura, 1997), and Flow (Csikszentmihalyi, 1990). The

constructs of each of these theories will be used within the framework of the Transtheoretical

Model (Prochaska & DiClemente, 1983; Prochaska & Marcus, 1994) in an effort to develop

practical applications for practitioners to use in motivating individuals to exercise more often.

This paper will also review the pertinent research that has identified the determinants of physical

activity and that best examines the assertions of these theories through clinical and community

based studies. The need for this research stems from the possibilities it provides for reducing the

national health care cost (Gettman, 1996), the implications it holds for decreasing the growing

epidemic of chronic diseases, and the ability that increased physical activity has to improve

people's quality of life (Bouchard et al., 1994; USDHHS 1996, 2000 & 2004).

<u>THEORETICAL LITERATURE REVIEW</u>

Self-Determination and Cognitive Evaluation Theories:

In order to follow the progression of motivational theories it is important to understand Deci's (1975) work on the study of intrinsic motivation and how it helped shape the concepts of self-determination theory (Deci, 1980), which was later utilized in the development of the theory of cognitive evaluation (Deci & Ryan, 1985). Cognitive evaluation theory explains the effects that a person's perceptions of self-determination and competence have on their motivation. More specifically they look at how these two innate psychological factors (self-determination and competence) are used within the context of the external and internal environment.

In 1980, Deci described the basis of self-determination as "that capacity to choose behaviors based on inner desires and perceptions" (pg.5). He further defined its operations by clarifying the difference between "self-determination" and "will". "Will is the capacity of the human organism to choose how to satisfy its needs," where as "self-determination is the process of utilizing one's will" (pg. 5). This is important in so far that it shows that our will must work within certain environmental boundaries that allow people to satisfy personal needs. A person's will requires them to understand and accommodate situational boundaries as a means of making the best choices that will satisfy their most urgent needs. Therefore it is the will of a person that helps improve, direct or guide one's self-determination for making better decisions, which enables them to expand their competence in order to satisfy their increasing needs.

The self-determination theory proposes that there are two general types of motivated behavior. There are chosen, intentional behaviors that seek to satisfy intrinsic and extrinsic goals, and there are automatic behaviors that require no conscious choice to be made in order to satisfy physiological needs (Deci & Ryan, 1980). Self-determined actions are taken in response

to internal and external information that is consciously processed in regard to one's expected outcomes; whereas automatic behavior is viewed as being outside conscious control. Deci and Ryan explain self-determined behavior as an action that begins with the processing of information from the person and their environment. Internal (personal) information is derived from one's personality, motivation, physical body and conscious memory. External (environmental) information is actively gathered and selected with respect to urgent needs. Behavioral decisions are the result of organizing and processing both internal and external information. Information that is gathered and processed with attentive understanding is said to drive conscious motives that will satisfy future needs. Thus, behavioral activities are chosen on the basis of three variables: (a) most reasonably expected outcomes given a person's capabilities or competence, (b) conscious motives, and (c) the information that supports the likelihood of obtaining the expected outcomes (Deci & Ryan). Deci and Ryan assert that conscious motives are the product of intrinsic motivation, and, in a cyclical process, intrinsic motivation is based on the innate psychological need for competent and self-determined relations with one's surroundings. In fact the process of making personal choices, in and of itself, offers intrinsic satisfaction, in that intrinsic motivation is a product of self-determination. When choices are made to participate in activities that produce an increase in competence it increases one's intrinsic motivation for that activity.

Deci and Ryan's (1980) self-determination theory proposes that all human behavior that is intrinsically motivated is based on the needs to develop competence through self-determined actions that will assist in obtaining greater understanding and success. Intrinsically motivated individuals seek no rewards separate from the experience and its associated affects (Deci & Ryan, 1980).

First developed by Deci (1975) and later extended by Deci and Ryan (1985) the cognitive evaluation theory utilizes the concepts of the self-determination theory and individuals' perceptions to explain how situational factors can influence the use of intrinsic or extrinsic motives (Weiss & Ferrar-Caja, 2002). When one chooses a behavior in the absence of external reward or constraints they are moving toward intrinsic motivation. If their choices are based on the presence of external rewards or to comply with constraints they are experiencing extrinsic motivation. Thus to the degree that a person is able to use their self-determination in the pursuit of satisfying their innate needs for increasing competence, knowledge and achievement the more likely they will be able to remain intrinsically motivated.

To achieve a greater degree of intrinsic motivation, the cognitive evaluation theory proposes the operation of two necessary environmental processes (Weiss & Ferrar-Caja, 2002). The first is the person's perceived locus of causality. If the person believes they are the force that makes things happen they will be more intrinsically motivated. If they perceive external forces are effecting their action they will feel less self-determined and will be less intrinsically motivated. External rewards and stringent control structures serve as mechanisms that externalize the locus of control, which causes a decrease in self-determination. Flexible control structures and the absence of relative rewards tend to internalize the locus of control and increase self-determination. The second process involves the changing of a person's perceived competence. Behavioral experiences that increase a person's belief in their abilities or competencies will increase their intrinsic motivation. Conversely, experiences that leave a person feeling less able or competent to satisfy their needs decreases one's intrinsic motivation. Perception of competence and causality are both seen as cognitive functions that serve to move a person from extrinsic to intrinsic motivation (Deci & Ryan, 1980).

Internal processes also play a vital role in determining if a person will tend to operate more

intrinsically of extrinsically. Deci and Ryan (1980) identify three personality types that have a

mediating affect on orientation toward being intrinsically or extrinsically motivated. People who

typically view outcomes as a product of their self-determined actions tend to maintain an internal

causality orientation and operate through intrinsic motivation. People who typically view their

behavior as a product of outcomes tend to maintain an external causality orientation and operate

through external motivation. And there are others who view their behavior and outcomes as

neither a product nor cause of the other. They are said to maintain an impersonal causality

orientation and operate through amotivation. In conclusion, it's the interaction of variables, the

environment (rewards and controls), feedback structure (to assess competence), and a person's

orientation (internal, external, or impersonal), that will influence whether a person utilizes

intrinsic or extrinsic motivation.

Continuum of Motivation Model:

Amotivation	**External Regulation**	**Introjected Regulation**	**Integrated Regulation**	**Intrinsic Motivation**
Unintentional action	*Factors clearly external to individual*	*Alleviation of internal pressures*	*Placed value on participation*	*Do it for the enjoyment*
- Ordered to do - Inability - Helplessness	- Rewards - Consequences	- Guilt	- Health benefits	- To know - To experience - To accomplish
- < < < Self-Determination > > > +				
+ < < < Control > > > -				

Figure 1.: Adapted from Deci & Ryan (1991).

Deci and Ryan's (1991) Continuum of Motivation presents a gradient view of the different

forms of motivation that drive an individual. The continuum allows researchers and practitioners

to examine the different categories of motivation in regards to one's ability to exert self-

determination or autonomy in the situation. It runs from *amotivation*, in which little self-determination is able to be applied, through the three *extrinsic motivation* categories (*external, introjected, and integrated regulation)* in which a gradual exchange of external controls are replaced with personal intentions. When the individual perceives a high level of autonomy and derives satisfaction from the experience itself, the final category of *intrinsic motivation* is reached. When intrinsically motivated a person expresses freedom and perceives the highest level of self-determination in what they choose to do.

   Amotivation is a result of one's perception that they lack the ability to perform an activity successfully (Vallerand, 1997). It was originally defined by Deci and Ryan (1985) as a personal belief that one's actions are ineffective toward accomplishing a desired outcome. People who act out of amotivation are often unable to identify why they engage in an activity, because they perceive no gain or satisfaction from their effort. An example of this could be criminals who don't attempt to rehabilitate themselves because they have no hope, or individuals who don't exercise because they perceive no benefit from it.

   External Regulation is motivation that is derived from factors that are clearly outside of the individual (Deci & Ryan, 1985; Vallerand, 1997). This type of extrinsic motivation produces action as a response to others providing incentives or punishments if action is not performed. The actor in these situations remains uninterested in the activity itself and participates solely for material or social gain or to prevent their loss. Examples of external regulation are the goal of winning a race or prize, or exercising in the military for the sole reason of avoiding the loss of rank or job. This type of motivation can certainly get a person moving, but they are only temporary. When threats or rewards are removed a person's behaviors will return to their normal

state, and, as research has indicated for the majority of Americans, that's a sedentary state (USDHHS, 1996, 2000, 2004).

Introjected Regulation is when a person is motivated to relieve themselves of guilty feeling or to gain the approval of others (Deci & Ryan, 1985; Vallerand, 1997). Motivation in this sense begets action because the actors take on the values of others, but do not assimilate them as their own. In this form of motivation the actor maintains a sense of conflict between the controls exerted through the outside values of others and the need to act independently. Examples of introjected regulation are: a mother who says to herself that she should exercise to remain healthy for her children, or someone who knows exercise is good for them, so they "should" do it. This type of motivation is also effective at times, but again the desire stems from a negative force and most people can only give into negative forces for a short period. They feel they have little control over their exercise routine, but do it because they should or have to (Vallerand, 1997).

Integrated Regulation is when people have placed a personal value on the activity (Deci & Ryan, 1985; Vallerand, 1997). They maintain the belief that they "want to" exercise, and have adopted the value as their own. In taking on the values of the controlling agent, be it a work environment or rules of the household, there is a relief from the conflict between value and personal independence. Vallerand posits that in using integrated regulation, people engage in activities of their own choosing, because the integrated values have affectively become part of their "self". Their choices become an operation of their larger being. An example of integrated regulation is a person who values being in good physical condition. Therefore, they follow a regular routine to achieve their goal. They still are exercising for enjoyment, learning or a sense of achievement, but they highly value the secondary outcome of fitness.

Within the context of the extrinsic motivation categories Deci and Ryan (1991) introduce the theory of internalization. The idea of internalization describes the transformation of regulators from outside sources to personal sources. It's through this process of internalization that externally stimulated actions can be turned into self-determined activities. The concept of internalization is closely associated with socialization, for it's through the interaction with social norms that people adapt to their environment as a means of satisfying their own needs for autonomy, competence and relatedness. By internalizing the social norms that people have carefully weighed against their own salient needs and determined are beneficial to them, values associated with those norms are assimilated into a person's own value system. In doing so they take on regulators from outside themselves, which allows them to better integrate with the people with whom they associate. Effectively they move themselves through their own free will toward a more integrated regulation. Through the process of integrating beneficial new values, people can be moved closer to acting in response to intrinsic motivation (Deci & Ryan, 1991).

The theory of internalization is closely associated with Deci and Ryan's (1985) cognitive evaluation theory. Even though extrinsically motivated behavior is not normally thought of as appealing to oneself, Ryan and Deci (2000a) posit that people perform such acts because they relate to others who promote, emulate, or value the behaviors. Thus relatedness is a key component of internalization. And, because people are more likely to adopt behaviors at which they believe they can succeed, it indicates that competence also plays a role in internalization. In order to complete their correlation, they clarify that to integrate an external control people need to know and understand it in relation to their other goals and values, which can only be done by freely allowing people to choose. Thus it's autonomy-supportive environments that enable people to adopt external values (Ryan & Deci, 2000a).

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"Intrinsic motivation is entailed whenever people behave for the satisfaction inherent in the behavior itself" (Ryan & Deci, 2000b, pg. 16). More simply stated it is when people do things purely because they enjoy doing them. In Deci and Ryan's (1991) earlier work they described intrinsic motivation as being comprised of multifaceted qualities. The first quality is that intrinsic behavior occurs when an activity is performed for which there is no apparent external gain, and is initiated as response of a person's free-choice. Secondly intrinsic motivation is present when actions are performed out of "interest". This "interest" brings a dimension of personal development or a drive to realize one's full potential. The third quality, borrowed from Csikszentmihalyi's early development of the Flow theory (1975), is that intrinsically motivating experiences must contain a quality of being optimally challenging. Deci's earlier work developed this idea further and contended that people are intrinsically motivated to search for and rise above optimally challenging situations that provide further knowledge of one's inherent ability and create opportunities for further development. The last quality they use in their definition is that intrinsic behaviors are based on inherent psychological needs for competence, autonomy, and relatedness. Deci and Ryan's defined these needs further. Competence is a person's effort to control the variables that will affect a desirable outcome. Autonomy is a person's effort to be the source of and determinant of their action. Relatedness refers to people's effort to relate to and care for others and experience contentment with the people and social settings that surround them.

Acknowledging that a person's environment will have a major effect on their willingness to engage in activities, research has sought to identify social factors that will better enable a person to use and develop self-determined actions. Most prominently they found autonomy support, structure, and involvement to foster self-determined behavior. Autonomy support is describe as

an absence of control that allows freedom of choice, minimizes specific courses of action, and promotes initiations (Deci & Ryan, 1991). It supports and respects a person's point of view. Supportive structures allow a person to control outcomes through the provision of clearly defined expectations and constructive feedback. Involvement is the amount of attentiveness and psychological resources that others provide to a relationship (coach to player, trainer to client, teach to student). Environments that include these three elements promote engagement through the satisfaction of one's psychological needs. Conversely, in the absence of these supportive variables, people have been observed to display amotivated behaviors, only acting as a mechanism of the system in which they work (Deci & Ryan, 1991).

Control is also an important variable within Deci and Ryan's (1991) continuum of motivation in that the degree to which controls are applied to a given activity is negatively associated with the perception of self-determination. Even the presence of external rewards for participation has the effect of acting as a controlling agent. When rewards or threats of consequences are introduced to intrinsically motivated activities it results in a loss of interest by the participants. This was first recognized by Deci in his earliest work with intrinsic motivation (1971) and later referred to as the "undermining effect" in his work with Ryan (1980, 1985) (as cited in Ryan & Deci, 2000b). Deci and Ryan contend that rewards serve to force or coerce people to feel, think, and act in a controlled manner that conforms to social norms. In turn rewards that are perceived as controlling work only to move people away from acting independently toward meaningful goals that may be internalized as personal values. Thus, in order for people to effectively internalize social regulations there must be an environment low in controlling agents that allows them to act autonomously.

Building on the belief that autonomy support and involvement are key factors to the process of internalizing regulators, Deci, Eghrari, Patrick and Leone (1994) reasoned that a person must understand or find some rationale for the importance of external regulators to their goals. Additionally, people will be more willing to adopt those important regulators if they are able to do so freely and if their point of view is acknowledged and supported by others.

Deci and Ryan (1991) encourage people and systems to begin a journey toward increasing amounts of self-determination. They put forth the belief that the environment one lives in can enable them to increasingly satisfy their basic psychological needs for developing competence, autonomy, and relatedness. A supportive environment that is optimal for further development is one that is devoid of controls or in which rational controls can be internalized through the support and involvement of significant others and within a reliable structure. In such an environment people are able to reasonably exert their freedom of choice in pursuing interests they find optimally challenging and that will result in further satisfaction of their psychological needs.

Self – Efficacy:

Self-efficacy theory (Bandura, 1997) helps to further the development of Deci and Ryan's self-determination and cognitive evaluation theories. Self-efficacy is similar to the construct of competence in that it includes a person's belief in their capabilities to produce a desired outcome through their own efforts. However it extends those beliefs into their contextual environment and uses them to judge whether they can organize their actions, circumvent barriers, and execute a plan in an effective way toward a predetermined goal (Bandura). Through this process self-efficacy uses two of Deci and Ryan's constructs, the assessment of ability (perception of competence) and choice to act (self-determination).

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In Bandura's (1997) theory of self-efficacy he explains that people seek to control the outcome of their life's situation as a way to relieve themselves from troubling times. He contends that the ability to influence the matters affecting one's life helps alleviate anxiety, apathy, and/or depression. Therefore it behooves a person to exert their energies in the directions that will enable them to grow in their ability to steer their life to desired ends. The more that people are able to influence the environment in which they live and command their own actions, the more likely they are to achieve the life they envision for themselves. A person's self-efficacy, or one's belief in their capabilities to organize and execute the necessary actions to attain their goals, is what a person uses to control their environment and actions in such a way to alleviate themselves from undesirable situations and put themselves in control of their lives.

Through Bandura's (1997) research he found self-efficacy to be one of the primary guides in a person's life. He postulates that a person's efficacy belief is a principal factor on which people base their decisions to approach or avoid a situation. If people believe they have no power to produce results, they will not attempt to make things happen. Conversely, if they believe they can be successful in achieving a self-determined goal they are more likely to attempt to take action toward the desired outcome.

"Perceived Self-efficacy is concerned with judgment of personal capabilities…" (Bandura, 1997, p. 11), within a certain context. Thus just because someone may have no faith in their ability to run a marathon doesn't mean they don't believe they are an athlete or have the ability to remain physically fit. Efficacy in one discipline can generalize to other areas if similar skills are required or can be used in the second discipline (Bandura). However if one believes that the set of mastered skills won't transfer or enable them to succeed in other tasks they would be said

to be inefficacious toward the new task. Bandura focuses on people's belief system, because

how people see themselves is a far better indicator of what they will attempt than is their actual

demonstrated ability (Bandura). It is their personal perception that most influences the level of

motivation. Bandura points out that this can have an immense effect on a person's life such that,

"Efficacious people are quick to take advantage of opportunity structures and figure out ways to

circumvent institutional constraints or change them by collective action. Conversely,

inefficacious people are less apt to exploit the enabling opportunities provided by the social

system and are easily discouraged by institutional impediments effective" (Bandura, p.6)

Sources of Self-Efficacy:

   People obtain and build self-efficacy beliefs through four types of assimilated information

(Bandura, 1997). The first and most significant source of efficacy information is obtained

through enactive mastery experiences. Mastery experiences are powerful in building one's self-

efficacy because they provide genuine confirmation that the ability is present within oneself to

control the many aspects of what it takes to succeed in a particular task. This could be likened to

the phrase, "seeing is believing." If people see that they can be successful at a task, they store

that information away in their belief system and retrieve it when they need to perform the same

or similar tasks in the future. Failure on the other hand can diminish one's efficacious beliefs.

However, Bandura points out that failures (setbacks, obstacles, difficulties) can also serve as a

force multiplier if persistence is applied and subsequent success is obtained. By struggling

through failures with perseverance people learn that some tasks will take multiple attempts but

can still be accomplished. These same situations also help bolster the coping skills used to

redefine or reevaluate situations and tasks into workable challenges. Some tasks that are met

with initial failure may serve as catalysts or reminders that previously mastered skills could be

honed in order to obtain greater success. Bandura looked at this as a way to exert more control

over the events of one's life. Repetitions of the attempt, failure, struggle, and success cycle

builds the belief that they have what it takes to overcome difficulties and will subsequently

persevere in tasks that they may previously have abandoned. They will work through setbacks

with new resilience. Thus each adversity, overcome, serves to make people stronger in their self-

efficacious beliefs.

Without question it's best to judge one's own ability by the merits of one's own successes,

but since people have limited experiences there are times they may meet tasks for which they

have no personal reference (Bandura, 1997). In such situation humans will look for other

references by which to judge their relevant abilities. Humans will look to the abilities of other

similar humans and if others have demonstrated success through skills that they believe that they

too possess, their own sense of self-efficacy will be enhanced. This describes the second source

of efficacy information which is vicarious experiences. Vicarious experiences are judged by a

diverse set of references from social and group norms to comparisons of close associates. People

who view themselves as good as or better than the subjects from which they draw a comparison

will gain a greater sense of self-efficacy. Conversely if people see themselves as less capable

than their comparison subjects it may serve to diminish their self-efficacy. However the power

of vicarious information to influence a person's beliefs can be diminished, depending on the

exactness or uncertainty of the reference subject used. The more uncertainty a person has about

the similarities between a subject's and their own capabilities, the less influential the subject's

performance will be.

Just as struggles can strengthen a person's self-efficacy in mastery experiences, so can their

choice of model subjects (Bandura, 1997). Struggles by subjects will increase efficacy through

trial and error met with perseverance, because subject models can teach new techniques for overcoming perceived obstacles to success. Models can also be used to discover new ways of thinking, such as problem solving skill that help them prevail in the face of adversity, which can be used to bolster a person's coping skills.

Supportive social systems can also bolster a person's belief in their own ability (Bandura, 1997). Verbal persuasion, although not as solid a source of efficacy as personal or vicarious experience, can move people to attempt to master new skills and apply a sustained effort when difficulties arise. If ideas of efficacy are even temporarily instilled in a person through persuasion and held long enough for the person to make a mastery attempt, persist, and succeed, it will promote skill building and personal efficacy. This is one area that Bandura urges practitioners to use cautiously, because if unrealistic beliefs of ability are created that result in inevitable failure it will only serve to destabilize the supported person's efficacy belief. Therefore persuasive information is best used to provide feedback on previously demonstrated skills. Building on what has been demonstrated as a skill and praising people for their efforts in attempting the activity is encouragement enough to build small increments of efficacy. Even minimal increases in efficacy can result in increased efforts and persistence that will then lead to greater efficacy.

The final source of self-efficacy that Bandura (1997) describes is physiological and affective states. At times the inability to control the influence of bodily functions in stressful or uncertain situations is seen as a threat to success in the situation. Overwhelming nervousness can be seen as an outward sign that a person is incapable of succeeding at their objective. Because nervousness or other high arousal states can hinder a person's performance, it can be inferred that as a person is able to decrease their sense of fear or anxiety they will increase their

expectation of succeeding in situations that normally make then nervous. This can be especially

important in physical activities. As a person begins to feel normal aches and pains or becomes

winded and sluggish they may interpret these as signs as physical inefficacy, and thus diminish

their belief that they are capable of sustaining a physical activity long enough to obtain the

desired effect (Bandura).   Thus the fourth technique of developing self-efficacy is achieved

through enhancing a person's physical condition, reducing their stress and helping them to

correctly interpret their bodily reactions.

Flow Theory:

   Csikszentmihalyi's (1990) theory of flow helps integrate Deci's (1980) and Deci and Ryan's

(1985) work on self-determination and competence and Bandura's (1997) thoughts on self-

efficacy.   His theory suggests that individuals that freely choose to engage in an activity in

which their capabilities match the challenge of the activity will be more motivated to attempt the

activity repeatedly. He further postulates that through such activities people can experience a

sense of extreme enjoyment, which will help them become more intrinsically motivated toward

that activity.

   Kimiecik and Jackson (2002) describe Csikszentmihalyi's theory of Flow as a "very positive

psychological state that typically occurs when a person perceives a balance between the

challenges associated with a situation and their capabilities to accomplish or meet these

demands" (p. 505). Csikszentmihalyi (1990) presents his theory of flow as an ardent journey

that people take in the pursuit of filling their lives with optimal experiences that will enhance

their being and quality of life. He asserts that people are more apt to realize optimal experiences

when they choose to reach just beyond their capabilities in an attempt to master something of

self-determined importance. Flow requires considerable effort toward an activity in which

people choose to participate. Nevertheless it is through expending maximum effort that people find true enjoyment. Through the collection of experiential data from thousands of subjects who participated in a variety of leisure and work activities, Csikszentmihalyi was able to identify eight components that contribute to deeply enjoyable experiences. Csikszentmihalyi proposes that through gaining a better understanding of the eight components a person will be able to create enjoyable experiences in almost any of life's activities. Therefore it is worth looking at each of these components a little closer.

First an individual must engage in an activity where they are able to balance their current skill with a corresponding level of challenge (Csikszentmihalyi, 1990). The level is one in which the activity can normally be completed successfully. The matching of challenge and skill is what allows a person to realize an optimal experience. If the challenge of an activity is above a person's capability it tends to cause frustration or anxiety. Conversely, if the challenges are below their skill level they will become bored. Flow is achieved when a person must use every bit of their ability and concentration to attain desired outcomes. However, Csikszentmihalyi warns that if the desired outcome replaces "performing as well as possible" as the focus of one's participation, the enjoyment is likely to weaken or be lost completely.

Flow's second component is the experience of achieving acute concentration on the task (Csikszentmihalyi, 1990). This takes place in an activity when there is a merging of action and awareness. In flow experiences a person becomes so consumed with the activity that they react spontaneously and their mind processes automatically, seemingly without cognitive evaluation of situational input or stimuli. People have expressed this sensation as "losing themselves in the activity," or "being in the groove" (Jackson, 1992). Although these experiences may seem to

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happen effortlessly the opposite is more realistic; great effort is required either physically and/or mentally. When acute concentration is interrupted the flow experience is over.

The third and fourth components are inseparable. They pertain to a person's concentration that is made possible through the existence of clear goals and instant feedback (Csikszentmihalyi, 1990). Goals and feedback are reciprocating components of flow in that without feedback people aren't able to determine if their actions are taking them toward the achievements they desire. Without the context of goals, feedback becomes irrelevant to subsequent actions. Goals and feedback provide the mechanisms for creating order in consciousness, or the processing of information that is harmonious with one's goals and without the worry of being incapable. Goals can be concrete or developed as part of a journey, as long as they are able to be used to assess whether or not the desired outcome is attained. Feedback is the information that allows us to determine if the goals are achieved.

The fifth component is the one that most often defines a flow experience (Csikszentmihalyi, 1990). It's when a person gets so caught up in the activity that other concerns are imperceptible. It occurs when complete concentration is required to meet the challenges of a task and person's mental capacity loses its ability to effectively recognize or process stimuli outside of the chosen activity. Information that is irrelevant to the immediate situation is pushed out of one's realm of awareness (Kimiecik & Jackson, 2002).

Flows sixth component is when people report having a sense of control. Never the less, Csikszentmihalyi (1990) describes this component as a paradox of control. In an uncertain environment one is really never in control. Nature constantly reminds mankind they are vulnerable in so many ways, and that it controls the ebb and flow of the world. In flow experiences, individuals perceive that they are exercising control in an uncertain environment. It

is evident when someone is mastering an activity, such as a surfing. The individual can't control how fast a wave moves or when it breaks. What they do control is the physical skills they developed from practicing, the knowledge they possess of how fast they have to paddle to catch the wave, and where to be on the wave for the best ride at the current wave height. The sense of control comes when a person meets environmental and situational challenges with acquired skills and is able to master the activity.

In the seventh component individual's sense a feeling of self disappears, but emerges stronger once they have reflected upon the experience. This component is similar to the merging of action and awareness and concentration on the task (Csikszentmihalyi, 1990; Kimiecik & Jackson, 2002). However it requires special consideration because in daily life people become so highly focused on how they look, think, feel, act, and what they say. At times peoples' self-consciousness can be an all consuming activity. Whereas in a flow experience the awareness of oneself dissipates and there is no judging of one's performances; there is just performance. Csikszentmihalyi notes that it is important to understand that the occurrences of losing oneself in moments of challenge are what allow people to expand themselves. It is in the reflection of those moments that people are able to come to a better understanding of their own complexity and attained strengths.

The eighth component is a skewing of one's sense of time (Kimiecik & Jackson, 2002). Hours may seem to fly by in minutes, or moments can seem to last for hours. During flow experiences times tends to become irrelevant to the activity in which one is involved. Most often people who experience flow have stated that "time flew by", but occasionally it is said to have "stood still". However, this component is not prevalent in activities where time is an integral

factor of the task. In these activities the ability to keep time is a required skill that enables one to meet the challenge.

These eight components help describe what it feels like to experience a sense of being in flow. But beyond these components Csikszentmihalyi (1990) emphasizes the key to an optimal experience is that it is, in and of itself, the reward for having acted. Even activities that are initiated for external reasons can become intrinsically motivating if people allow themselves to be consumed by the events and happening of that activity. Therefore if we can teach people to enjoy the moments of their lives, it follows that they will work harder at enjoying their lives.

Transtheoretical Model:

The fore mentioned theories give practitioners a view of the constructs that enable them to increase motivation for a desired behavior. They can be likened to the tools that can be used within a system or process to produce beneficial outcomes. The transtheoretical model and its stage of change model are the systems that can enable the constructs of Deci, Ryan, Bandura, and Csikszentmihalyi to be used more efficiently and effectively.

The central concept of Prochaska and Marcus (1994) Transtheoretical model is the stages of change. The stages of change consist of five stages through which an individual works by adopting and maintaining new knowledge and behaviors. In the precontemplation stage, an individual is not considering making any changes for the foreseeable future. During the contemplation stage, a person is thinking about making a behavioral change sometime within the next six months. In the preparation stage, a person has begun making some changes, but not at the recommended level necessary to realize the benefits of the changed behavior. In the action stage, a person has made the recommended changes and is sustaining the new behavior at a level that will benefit them, but has been maintaining the behavior for less than six months. In

maintenance, an individual has sustained the behavioral change at the recommended level for six months or more.

Prochaska and DiClemente (1983) characterize precontemplators as people who are defensive about and avoid thinking about changing the negative behaviors they maintain. In reviewing Prochaska's and DiClemente's stages of change model, Terry Lawrence (1999) notes that precontemplators may be unaware that there is a problem with the way they behave or the detrimental aspects of their chosen lifestyle. As a result precontemplators may begin to move out of this stage when it is forced upon them from an outside agent, such as through the discovery of a health threat by a physician who then prescribes the change, or a social or employment dilemma that forces them into rehabilitative therapy.

Contemplators have realized that a problem exists and begin the process of seriously thinking about how to change (Lawrence, 1999). People in this stage will often engage in gathering and ingesting copious amount of data about the problem itself. They often know where they want to be or the behaviors they want to leave behind and possibly even how to go about it, but aren't ready to take the first step toward change. Instead they exert significant energy in seeking negative information about their problem behaviors while simultaneously seeking out information on the positive aspects of making the change. Prochaska and DiClemente (1983) classify this process as consciousness raising or the weighing of the pros and cons of making the change. It often includes a person dealing with what they positively associate with the behavior and how they'll cope with the loss of those familiar aspects of their life. For sedentary individuals this could include spending time in front of the television with their family, relaxing with friends, or lazing around on weekend mornings. Lawrence suggests using a balance sheet of the positive effects of making the change to counterbalance what will be lost in making the

change. Individuals looking to take on a more active lifestyle could identify with improving their health, weight control, reduction of risk for cardiovascular disease and type II diabetes, increased energy and raising their cognitive processes. The Transtheoretical Model and its stages of change can be used to involve people in an exercise to tip their decisional scales toward making positive change. In doing so they may inevitably weigh the pros and cons of external regulators. Although this isn't the most ideal way to maintain long-term physical activity it may be useful to get them started in physical activities which can improve their self-efficacy and help them advance toward more optimal levels of motivation. Prochaska and DiClemente also recognize the contemplation stage as when individuals reevaluate themselves with regard to their chosen behaviors. Sedentary people may realize a disappointment in themselves for being in poor shape, overweight or lacking the energy to participate in activities they once enjoyed. Feelings of guilt or disappointment correspond to introjected regulation on the continuum of motivation. This may indicate it would take external motivators to increase contemplators to take action against their unconstructive feelings.

Preparers are at the point of taking the preliminary steps to effect their desired change (Marcus & Lewis, 2003). Preparation can be seen in a number of small behavioral changes that set the stage for subsequent action. Scheduling time to exercise, researching and buying walking or running shoes, or looking into available resources in their local area (walking paths, recreation centers, programmed classes) are some indications that an individual has moved into the preparation stage. Lawrence (1999) points out that preparers may not be fully committed to making the change, but are looking into the possibility of being successful should they expend the energy to do so. This would indicate that preparers are assessing their own self-efficacy toward an exercise or physical activity program. DiClemente and Velasquez (2002) make the

argument that people in the preparation stage may have attempted to make changes in the past but have failed for one reason or another. Through their unsuccessful trials they will have learned valuable lessons that will help them develop better strategies for success. It is critical not to pass over or move too quickly through the preparation stage. People need time to develop plans and schedules, and shift their life's responsibilities to allow for adequate mental and physical resources to be available in order to succeed in their change (DiClemente & Velasquez, 2002).

The action stage presents the most visibly noticeable and busiest time for the individual wanting to make the ultimate change (DiClemente & Velasquez, 2002). A serious commitment has been made, the plan to instill the change has been developed, a schedule to follow is set and action is being taken in earnest. Action stage often coincides with modifying one's environment and time allocation to make way for the requirements of the new behavior. This may be the first time other people are being effected or recognize what the changes will mean for them. Their recognition can come in a variety of forms, from being very supportive to being resistant to the change because it may in some way detract from the relationship they have enjoyed with that individual.

Prochaska and DiClemente (1983) provide some coping skills in their earlier studies that help people in the action stage overcome such difficulties. The first is "self-liberation" or positive self talk that reinforces the message that change is within their power. Second is "counter-conditioning" in which a person substitutes a positive behavior instead of giving into their old habits. Third is "stimulus control" or avoiding situation that were used as prompters of the behavior they are committed to changing. Lastly is "reinforcement management" in which a reward systems is established to help remind them that the efforts they are making are worthy of

praise. This last strategy can come from internal or external sources, such as self-praise every time an exercise is started and then again when it is completed, or allowing the recognition of others to be a reward in itself.

It was originally believed that the final stage of change was a fixed state of being (Lawrence, 1999). However the very essence of "maintenance" begets action. In this final stage the results obtained in the action stage are reevaluated and lessons learned along the way are assimilated into a comprehensive plan in order to prevent a relapse of negative behavior. This in fact can be seen as the most important stage in the model, for without continued commitment to the effort that was put into making the desired change, there is a greater possibility of a setback. Unlike other stages that people worked through to achieve their goals Prochaska and DiClemente (1983) didn't provide a finite time frame on the maintenance stage. It is seen as lasting anywhere from 6 months to as long as a lifetime.
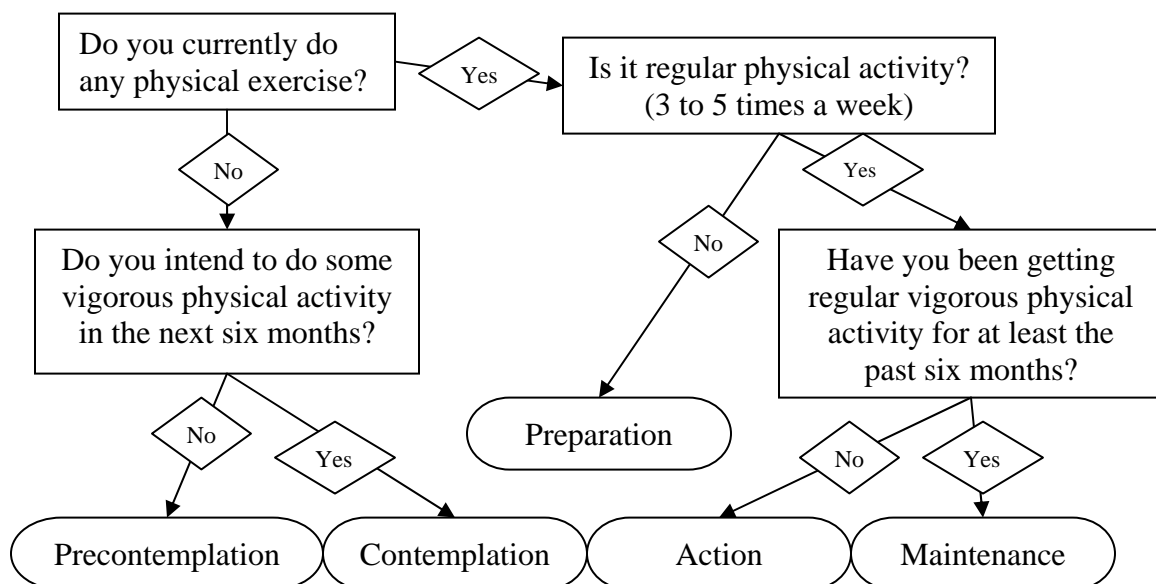
Figure 2.: Adapted from Marcus, Rossi, Selby, Niaura, & Abrams (1992).

Determining a person's stage of change is ultimately important for practitioners, because it allows them to tailor their interventions programs to optimally suit the needs of the individual.

In order to determine a person's stage of change for physical activity, Marcus, Rossi, Selby, Niaura, and Abrams (1992) used a simple four question assessment tool that would indicate the stage in which a person is currently (Figure 3.).

One of the most beneficial aspects of Prochaska and DiClemente's stages of change model is that it helps practitioners view each stage as a temporary state that can be influenced through increased knowledge. Subsequently clients can turn that knowledge into action (DiClemente & Velasquez, 2002, p. 204). In the absence of this understanding meeting clients' resistance could feel like a futile effort. Knowing a person's stage of change is only a starting point. Learning what brought them to their current position and what may be holding them back will be the key to helping them progress through the stages and making permanent changes.

The theories and constructs described above have allowed researchers to explore a vast array of human behaviors. This section of the paper will examine a portion of that research in regards to physical activity and exercise. First it will review what has been found to be determinants of physical activity. Second it will review studies that have highlighted the affects of the above constructs on the adoption and maintenance of physical activities.

Research Review - Determinants of Physical Activity:

At the urging of the U.S. Department of Health Service and their Healthy People 2000 report Dishman and Sallis (1994) began research into what motivates a person to maintain a regular exercise program or to begin to participate in regular physical activities. They sought to understand what knowledge, attitude, behaviors and social skills assisted people in becoming or sustaining an exercise regiment. To do this they classified *determinants* into three categories; "past and present person attributes, past and present environments, and aspects of the physical

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activity". Due to the lack of substantial research that studied age, disability, minority, or gender groups during this time frame their observations are provided in general population terms.

Moderate versus vigorous physical activity is strongly associated with age and gender. Aging individuals and women were more likely to participate in moderate physical activity, such as walking, as opposed to taking part in vigorous activities. It was shown that men are more likely to participate in vigorous activities. Their conclusion was that women and older adults view walking as a more acceptable activity.

Other determinants of adoption have also been investigated. One study conducted in Canada (Stephen & Craig, 1990) found that self-schema, or the perception that people hold of themselves as exercisers, was the primary determinant of people participation in exercise in the near future. Determinants for adopting vigorous exercise were found to be more closely associated with a person's self-efficacy and their neighborhood environment. Education, self-efficacy and social support systems were the strongest determinants for females adopting exercise routines. Dishman and Sallis (1994) note that many of the same determinants found to predict the adoption of exercise are also seen for those maintaining routine exercise programs, although not to the same degree. Similar determinants were more useful in predicting the adoption of exercise.

Demographics were found to be strong determinants of physical activity (Dishman & Sallis, 1994). Education, income, and male gender are positively correlated, while age is negatively correlated, with exercise (Dishman & Sallis). Studies conducted prior to 1988 found obesity to be a negative determinant. The cognitive attributes most positively associated with physical activity were shown to be self-efficacy, intention to exercise, and perceived health or fitness.

Social support from a spouse, family, friends and peers were the best determinants in regards to a person's social environment.

The only behavioral attribute shown to be strongly associated with physical activity was past participation in free-time activities as an adult. In the studies they reviewed Dishman and Sallis found no indication of an association between attitude toward exercise or knowledge of health and exercise participation. The activity's intensity and the perceived exertion associated with an activity were both negatively associated with participation (Dishman & Sallis, 1994). This may indicate that if a programmed activity is above the participants' skill level and they overexert themselves they are likely to drop out of the activity.

To bring this information more up to date, Sallis with Owen (1999) continued Dishman and Sallis' work in reviewing the studies of physical activity and exercise determinants. Age and ethnicity (nonwhite) were still found to be negative determinants, as were barriers to exercise and mood disturbances. Education, gender (male), genetic factors (absence of disabilities), and income level were all positively correlated with physical activity. Sallis and Owen's latest review of available studies showed growing evidence of the strong association between psychological, behavioral, and social determinants and physical activity. Social support and self-efficacy both provided strong positive associations as indicated in the previous review. The more interesting results showed that perceived benefits, enjoyment of activity, processes of change (within the stages of change model), intention to exercise, lower intensity of exercise and eating habits were also strongly associated with physical activity (Sallis & Owen, 1999). As previously indicated they found no association between exercise and knowledge of health and exercise, a person's attitude toward exercise, or being overweight or obese. As this is contradictory to many theories Sallis, Hill, Fortmann and Flora (1986) provide clarification that

there is limited research to confirm this finding (as cited in Sallis & Owen). Furthermore, Sallis

and Owen perceive this finding to be understandable in light of the fact that, despite most people

having knowledge about the benefits of exercise, the majority don't participate in regular

activities. They also determined there is little or no association with a person's history of

participating in childhood exercise, school sports, their susceptibility to illness, and current

exercise.

   In reviewing individual determinants for exercise, Sallis and Owen (1999) point out that

Bandura's social cognitive theory, specifically "self-efficacy," is by and large the most supported

variable in predicting a person's behavior. Although they posit that it is not surprising to find

that people who exercise regularly will have higher self-efficacy than those who don't, they

found that people not in an exercise program who indicated stronger self-efficacy were more

likely to become active in the near future. Their research also indicated that increases in self-

efficacy correspondingly resulted in increases in physical activity. Enjoyment as a determinant

was found to be positively associated within three studies reviewed showing that future studies

are warranted in this area. Finding enjoyment to be a determinant of exercise is important in that

it is also associated with intrinsic motivation. Intrinsic motivation typically refers to performing

an activity for the pleasure and satisfaction it provides (Deci & Ryan, 1985). It stands to reason

that if enjoyment can be increased and thus intrinsic motivation, it may result in a person's

increased desire to exercise. Intention was also shown to be a single variable that strongly

correlates to physical activity. Although barriers prove to be a negative determinant and there

are a myriad of perceived barriers and/or "excuses" they present a large concern for practitioners.

The lack of time is without rival as the most mentioned barrier to exercise, but it is just one of

the many that can be related to environmental or interpersonal issues. If barriers are physical in

nature it will take social or environmental changes to overcome. If they are subjective they will need to be dealt with individually to help people change their belief system or their perspective of the problem area.

Research Review – Self-Determination & Cognitive Evaluation Theory:

The previous examination of physical activity determinants provides some validity for the constructs of self-determination and the cognitive evaluation theory. Moreover, because of their significance this section of the paper will concentrate on research that specifically looks at the effects these constructs have in intervention programs.

In their work with cystic fibrosis patients Prasad and Cerny (2002) determined several factors that would influence adherence to physical therapy which include many of the constructs from the self determination and cognitive evaluation theories (Deci & Ryan, 1980, 1985). Healthcare teams that displayed involved interest with patients and their families and engaged them with continuous educational information realized an increase in a patient's effort toward physical therapy. The increased knowledge about their condition and reasons for a particular treatment enabled patients to take ownership of their treatment by choosing in which activities to take part (Prasad & Cerny, 2002). Another important factor that Prasad and Cerny observed with some of their patients was the continued involvement of parents. Children whose parent would leave them to manage their own treatment as they grew into their teenage years were far less likely to adhere to prescribed treatments. To a significant degree they found that compliance to treatment was associated with a patient's perceived competence in a particular activity, which indicates the importance of finding activities at which a patient is competent and enjoys. The likelihood of sustaining an exercise program is improved by clear and continuous encouragement provided through a diverse support system, and the continued development of each client (Prasad &

Cerny). Regular contact between participants and facilitators (e.g., doctors, trainers, nutritionists, and managers) who display genuine concern and interest can also improve adherence. Prasad and Cerny's study reinforces the opinion that exercise activities should be enjoyable and enable social interaction if they are expected to be maintained.

Through the analysis of recent studies that followed participants in excess of 6-months, Marcus et al. (2000) verified several factors that assist in adopting and maintaining physical activity prescriptions. As indicated through many of the major studies conducted in the early 1990s (Fletcher et al., 1992; Pate et al. 1995), Marcus and her colleagues recognized that providing healthy adults the freedom to choose activities that best suited them, including moderate-intensity short bouts of exercise and lifestyle physical activities, is a vital factor in long-term exercise participation. Project Active was conducted by Dunn and her associates (1997, 1999) to complement and enhance a person's perception of freedom to choose through an increased knowledge of behavioral skills. Initially, after 24 months of intervention, research subjects that adopted lifestyles of their choosing showed similar effects to the subjects from the externally structured exercise group. However, at the 18 month follow-up of the formal intervention program, it was found that the lifestyle group remained more physically active than the structured program group (Marcus et al., 2000).

Marcus and her colleagues (2000) also cited a study conducted by Friedman, Williams, and Levine (1997) using 36 impoverished cardiac rehabilitation patients realized an unprecedented 90% adherence rate to the prescribed physical activities. They attributed their overwhelming success to the small group size which gave them the ability to tailor their approach and increase the staff's direct involvement with each patient. An earlier study (Elmer et al., 1995) indicated that involving patients with hypertension in intervention programs that provided informational

materials to help increase their knowledge of their illness and awareness of the benefits of their exercise treatment can have lasting effects. In this study 86% of the men and 81% of the women report increased energy expenditure after two years of being in the program, and 50% of the participants were able to maintain the activity level up to four years without continued intervention. Two components of the cognitive evaluation theory could be credited with the positive results seen in this study. The first is relatedness; the intervention staff provided individual counseling with each participant every six to twelve weeks which provided the opportunity to build personal relationships. The second is that increasing self-determination through the internalization of the value of exercise and the opportunity for choice appears to have affected a greater commitment.

Tailoring programs to fit an individual's needs has been found to be more advantageous for program participants. Bock, Marcus and Pinto (2001) realized a significant increase in participation in physical activities within her study group that was provided with one-on-one feedback. Individualized interactions also proved to increase activity levels to the CDC/ACSM recommended levels of physical activity. Those who received individual attention logged more active time than groups who were provided only printed materials. This study upholds the previous research of Deci and Ryan (1985) and the third dimension of their Cognitive Evaluation Theory, relatedness. Participants were given an opportunity through interaction to form personal connections with the researchers and thus foster intrinsic motivation. The results of their study provide solid implications that active intervention programs that serve to increase a person's competence and self-determination through the internalization of educational information and active participation in physical activities can have an enduring influence on maintaining physical activity. These results contradict the earlier findings of Sallis and Owen's (1999) meta-analysis

to identify determinants of exercise. It is possibly that through the relationships built during the intervention process and by providing valid and pertinent education material to the participants on health issues it would be held more salient than casually acquired knowledge from disinterested sources.

An earlier study conducted on the fitness of Australians that focused in part on the respondents' preference for support sources found that older people most often seek the advice of their physician, whereas younger individuals (18-39) are more comfortable gaining the advice of friends or from group activities (Booth, Bauman, Owen, & Gore, 1997). Additionally, this study reviewed their respondents' preference for physical activities and found that a wide range of activities are required to satisfy the needs of everyone. These findings are significant in that they support two innate psychological needs of the Cognitive Evaluation Theory; relatedness and self-determination. The findings suggest that by offering a wide array of activities people are more apt to perceive a freedom to choose what is interesting to them, and through the use of dynamic and knowledgeable support systems people who seek advice and are provided with pertinent information in an encouraging environment will be more likely to adopt and maintain an active lifestyle.

Although Prasad and Cerny's (2002) study with cystic fibrosis patients gives clear indication of the importance to Deci and Ryan's social cognitive theories they also support the work of Csikszentmihalyi and his theory of "Flow" (1990). They propose that involvement in activities is dependent on the fun or enjoyment one derives from their participation. A greater acceptance and adherence was indicated when patients were able to choose activities they could enjoy and share with others that provided the benefits of improved health (Prasad & Cerny, 2002).

In studying how parents influence their children's involvement in physical activity Trost, Sallis, Pate, Freedson, Taylor and Dowda (2003) found a child's skills and abilities had little correlation to a parent's activity level. Their basic observation was that parents' independent activities did little to develop the athletic skills of their children. Parental support in the forms of transportation to physical activities, being attentive to their child's activities, and encouragement were determined to better facilitate a child's confidence and efficacy levels. This study shows that whether a parent is athletic or not, their involvement of supporting their child's physical activity can provide a boost to their child's self-efficacy and, in turn, increase their desire or motivation to participate.

Sallis et al. (1989) studied the determinants of vigorous exercise and determined self-efficacy to be so overwhelming correlated that they removed it from further analysis in order to concentrate on other factors. In order of importance they found modeling, friend support, diet, benefits, coordination, home equipment and barrier (negatively) to be correlated with vigorous exercise. The two most significant factors, modeling and friend's support, uphold Deci and Ryan's (1991) construct of relatedness. Modeling looked at the number of adults in a household that exercise regularly, and friend's support examined how often friends exercised with or offered to exercise with the participants. Knowledge of diet and benefit, the next two factors most closely associated with vigorous exercise, also provide support for the cognitive evaluation theory under the construct of self-determination. It's assumed that in order for people to eat healthy and understand the benefits of exercising they must have an extensive knowledge base upon which to make positive decisions. The availability of home equipment could also indicate the use of a person's self-determination, as it takes a conscious effort to research, decide on and purchase equipment for their home. Having equipment available in the home also allows people

to exercise on their own schedule. When separated the barriers present an interesting variable for program managers. The most identified barriers were lack of interest and lack of enjoyment. Sallis and his colleagues (1989) believe this may indicate the need for additional information to increase the respondents' awareness of the importance of and enjoyable options for exercise.

Vallerand and Losier (1999) showed through their studies that motivation has a causal effect on maintenance of exercise and activity. From this they proposed that motivation should be able to be increased by manipulating social factors, such as the coaching style used and family support structures. They developed a swimming program that taught coaches to be more autonomy supportive in order to allow competence and self-determination in their athletes. Swimmers in the study were instructed in how to increase their autonomy and become proactive in their training routine. These measures were shown to increase the athletes' perception of competence and their intrinsic motivation (Vallerand & Losier, 1999). The motivation outcome of their study was most impressive. Participation in practices went up by 33 percent and the annual dropout rate decreased by 31 percent. Their study showed that by manipulating a program's social structure it was possible to influence an increase in competence, autonomy, and intrinsic motivation.   Vallerand and Losier proposed that by increasing people's intrinsic motivation it should enhance persistence.

In their work to formulate a model of contextual motivation in physical education Standage, Duda and Ntoumanis (2003) also utilized the constructs of the self-determination theory to predict intention toward exercise. They found the strongest means of affecting the intention of a person was to develop a social atmosphere oriented toward autonomy and mastery. They found that an autonomous mastery climate would increase participants' personal autonomy and thus help strengthen their sense of relatedness to other participants in the activity. Through this

process they also observed that this system boosted participants' self-determined motivation (identified regulation and integrated regulation) which then increased the participants' intention to engage in the activity. For exercise practitioners it is important to note that participants felt more autonomous when they perceived their success to be related to their hard work and the personal competence learned through the activity. The process of creating autonomy within a program also seems to feed on itself as indicated by participants feeling more autonomous, competent and related when they perceived a climate low in controls, but high in autonomy-support (Standage, Duda, & Ntoumanis, 2003). From these results it is then not surprising that they found competence to be an essential construct in predicting self-determined motivation. Subsequently self-determined motivation predicted a person's intention to participate in physical activities in their leisure time.

Research Review – Continuum of Motivation:

Although few studies have been conducted to determine the validity of the Continuum of Motivation Model for understanding exercise behavior two studies have examined the development of research instruments using this model (Mullan, Markland, & Ingledew, 1997; Ingledew, Markland, & Sheppard, 2004). Mullan, Markland and Ingledew (1997) developed the Behavioural Regulation in Exercise Questionnaire (BREQ) to measure amotivational, external, introjected, identified (integrated), and intrinsic regulation for exercise. Through their initial development studies they were able to detect differing degrees of self-determination at each stage of the continuum of motivation. However in a reevaluation project they eliminated the questions for amotivational forms of regulation and were better able to confirm consistencies among the respondents. The results of this study showed promise for the BREQ, but requires additional studies to validate the instrument. A subsequent study conducted by Ingledew,

Markland and Sheppard used the BREQ to determine personality traits that are more associated with existing exercise behaviors. They found associations between neuroticism and introjected regulation, extraversion and identified and intrinsic regulation, openness with less external regulation, conscientiousness and intrinsic regulation, and psychoticism and external regulation. Conclusively their study indicated conscientious individuals are more apt to advance along the continuum of motivation toward being intrinsically motivated to exercise. In part this was determined from the finding that extroverts are more self-determined in relationship to their need for relatedness, whereas conscientious individuals are more self-determined in relationship to their need for competence, a critical element of intrinsic motivation (Ingledew, Markland, & Sheppard).

In their search to enhance the development to intrinsic motivation Ryan and Deci (2000a) examined social climates that affect this human behavior. They found environments that encourage autonomy and competence are more apt to facilitate intrinsic motivation than situations that are controlling. Incidentally they found where autonomy, competence, and relatedness were supported there was an increased capacity for the internalization of relevant social values and a greater sense of social responsibility. Ryan and Deci believe this to be significant of those who wish to motivate others to commit to socially responsible conduct.

Intrinsic motivation has also been found to be associated with greater adherence to exercise programs (Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). In their examination of participants enrolled in Tae Kwon Do and aerobics class, Ryan and his associates found that people seeking to improve their ability and/or engage in enjoyable experiences attended workouts more often and remained in the exercise programs for a longer period of time. Conversely, people who sought to improve the body-image, which is believed to be an extrinsic

motivator, showed significantly less adherence to their chosen program. Their findings suggest that in order to affect greater adherence to exercise activities practitioners should focus on promoting the inherent enjoyment of being physically active and the increase in competences it provides (Ryan et al., 1997). A subsequent study indicated that fitness motives (a sense of being strong, health and able) were also positively correlated with greater attendance. Ryan and his colleagues believe fitness motives to be intrinsic aspects of exercise and thus associate it with intrinsic motivation. Participants in their second study who perceived greater competence and enjoyment performed longer workouts (increased adherence) that were more challenging. From these findings it is implied that people with greater motivation appear to experience greater enjoyment in the exercise (Ryan et al.).

Similar results were found in competitive swimmers studied by Pelletier, Fortier, Vallerand, and Briere (2001). They found that swimmers who were intrinsically motivated and self-determined demonstrated more persistence over two competitive swimming seasons. Whereas, extrinsically motivated people were significantly more likely to drop out during the second year of their study.

Mullan and Markland (1997) examined similar correlations between a person's self-determination and their stage of change. They found that participants who exercised consistently (for more than six months) and regularly (3 to 5 times per week) had significantly higher self-determination scores than those who were inconsistent with their workouts. This finding suggest that if a person has a greater sense of self-determination (identified or integrated regulations) or is intrinsically motivated it may lead to increased exercise behavior and the maintenance of exercise adherence (Mullan & Markland).

Research Review - Self-Efficacy:

As previously reviewed, self-efficacy has been found to be a significant determinant of exercise and physical activity. In this section of the paper research that specifically relates to the effects of self-efficacy on exercise and physical activity will be examined.

Through studying exercise determinants, Buckworth and Dishman (2002) concluded that self-efficacy was the variable most consistently associated with physical activity. In their metanalysis they found evidence that self-efficacy influenced a person's progress from being inactive to participating in regular exercise activities. Self-efficacy was also shown to be a predictor of a person's willingness to participate in physical activities. Self-efficacy has been shown to be an important factor in both initiation and sustainment of exercise regiments. In line with this same thinking Buckworth and Dishman subscribe to the conclusions of McAuley and Blissmer (Figure 3; 2000) that see exercise self-efficacy as both a determinant and a consequence of physical activity.
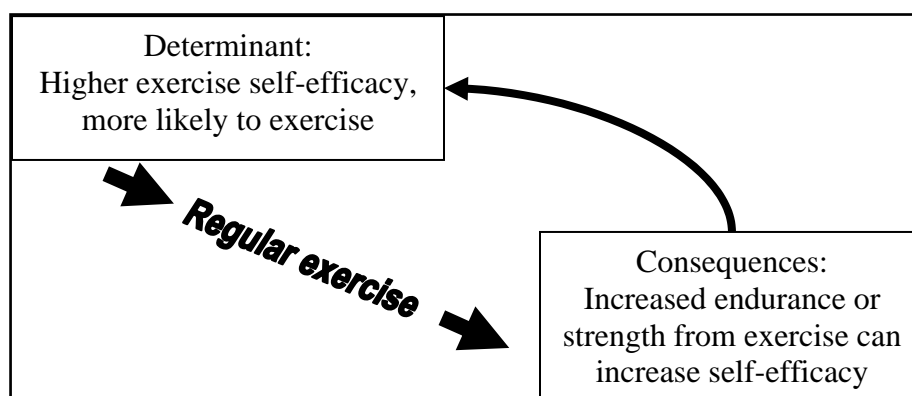

Figure 3.

In their work to discover indicators that could predict an individual's probability of adopting and maintaining vigorous physical exercise Sallis, Hovell and Hofstetter (1992) found self-

efficacy to be the most important predictor of beginning exercise programs for both men and women who were sedentary. Self-efficacy was also found to be the number one indicator that men would maintain vigorous exercise routines. These finding supported earlier finds of Sallis et al. (1989) that also indicated self-efficacy to be the strongest of 23 correlates with exercise behavior.

In studying cardiac rehabilitation patients that were prescribed exercise, Yates, Price-Fowlkes and Agrawal (2003) determined self-efficacy to be a significant factor in adoption and maintenance of physical activity. The same results were found in a study by Netz and Raviv (2004) who advocate for intervention programs that increase self-efficacy. Netz and Raviv's study also helped support the cyclical effect of Bandura's (1997) self-efficacy theory in that by increasing an individual's self-efficacy they stimulated an increased desired to become physically active. Consequently, by increasing one's physical activity they also increased their subject's self-efficacy, which increased their desire to be more active.

Dishman and his associates (2004) sought to increase the level of physical activity among black and white adolescent females through the Lifestyle Education for Activity Program (LEAP) by raising the participants' self-efficacy. Their research supports the reciprocal effect physical activity has on self-efficacy that was proposed by McAuley and Blissmer (2000). That is by increasing the subjects' physical activity they were able to increase their self-efficacy, which in turn, increased their physical activity. The key to the program's success was the comprehensive intervention program facilitated both within and outside of school that increased self-efficacy and physical activity. The program was designed to support the girls' interests and physical activity needs. Instructional programs were provided in a variety of settings, including health education, consumer science, and biology classes. Emphasis was placed on the learning

of self-regulatory skill, such as goal setting, time-management, overcoming barriers, and self-reinforcement. The one year program was designed to develop competence in lifestyle activities, including dance, self-defense, aerobics, and resistance training, through noncompetitive, mastery oriented, successful experiences. As a result of their study Dishman and his colleagues advocate interventions to increase self-efficacy through the sources identified by Bandura (1997) (reinforcement history, observational learning, persuasion, and perceived exertion) in order to influence a person's motivation to engage in increased amounts of physical activity.

Oka, Demarco and Haskell (in press) recently worked with patients who had experienced a myocardial infarction to determine how self-efficacy could influence their adoption of exercise training as part of their rehabilitation. Their findings suggested that people participating in a regular exercise program of walking increased their sense of exercise self-efficacy. More surprising is that their subjects with greater self-efficacy recorded longer treadmill tests and greater oxygen uptake than those with lower self-efficacy. It could be inferred that increased self-efficacy came from a sense of being more competent in the exercise because they showed fewer signs of overexertion and were more comfortable during the activity. As in the previously reviewed study (Dishman et al., 2004) the intervention program was created to significantly enhance the participants' self-efficacy. The individuals in the exercise group enjoyed multiple contacts with the project team over the course of the program, which could account for some increases due to outside factors such as relatedness and involvement.

Sallis et al. (1989) studied the determinants of vigorous exercise and determined that self-efficacy was the most highly correlated variable in their analysis. They also found a person's coordination to be associated with vigorous exercise, which provides support to Bandura's theory of self-efficacy (1997) in so far that a person's ability increases their self-efficacy. In

examining long-term maintenance of physical activity in older adults, self-efficacy was found to be the most important evidence that a person would maintain an exercise routine (McAuley et al., 2003).

Using Tai Chi as an exercise medium Li (2001) and his research associates found that through practice participants significantly improved their self-efficacy and perceived level of physical functioning. From this finding Li suggested that by engaging in physical activity, such as Tai Chi, it is possible to raise an individual's self-efficacy and physical functioning, which would in turn positively affect health.

Research Review – Flow Theory:

The theory of flow is significant to developing motivation in exercise because it has been found to be closely associated with intrinsic motivation and self-determined extrinsic motivation (Kowal & Fortier, 1999). Flow is an important concept for practitioners to understand as it provides a guiding structure for designing leisure and exercise programs that people enjoy and in which they can immerse themselves. Practitioners can provide activities that provide people the free choice to participate, which challenge them at their current skill level. In doing so, participants will need to give their complete concentration in order to comply with clear goals that provide relevant feedback. Through their focused effort participants should be able to successfully accomplish the goals of the program and thoroughly enjoy the experience of participating in the activity. Kowal and Fortier (1999) have found that this can be best facilitated when participants perceive high levels of relatedness, competence, and autonomy, which provide additional support for the theories of Deci and Ryan.

Research Review – Transtheoretical Model:

As mentioned earlier in the review on self-determination research, Marcus, Dunn and their associates (2000, 1997, 1999) found that groups who adopted lifestyle changes were more likely to maintain their physical activity level in long-term studies. An important element of their study was the development of their interventions to target behaviors based on the Prochaska and DiClemente (1983) stages of change model. By matching their intervention program with each group's assessed level on the stages of change model, the project staff was able to increase physical activity. This demonstrated ability to maintain increased physical activity suggests the legitimacy for using the stages of change model to affect long-term adherence to physical activity and exercise programs.

The findings of Netz and Raviv (2004) provide strong support for the use of the Prochaska and Marcus (1994) Transtheoretical Model. From their research they recommend the use of tailored programs that target an individual's need for motivational incentive related to a person's stage of change which is appropriate for their age, gender, and level of education. By accessing individuals and providing each a tailored program, they demonstrated that there is greater potential for them to increase their interest, awareness, and motivation for becoming active.

Marcus and Lewis (2003) examined the use of the Stages of Change Model with physical activity and found five behavioral process and five cognitive processes used by people as they move through the different stages. The behavioral process included substituting alternatives, enlisting social support, rewarding oneself, committing oneself, and reminding oneself. Cognitive processes included increasing knowledge, being aware of risks, caring about consequences to others, comprehending benefits, and increasing healthy opportunities. Many of the identified processes can be tied to the constructs of the Deci and Ryan's (1985) cognitive evaluation theory. Self-determination is enhanced by increasing one's knowledge of the

situation and its consequences. Competence can be built through successful activity experiences.

Relatedness can be matured through the development of support groups.

In their report for the President's Council on Physical Fitness and Sports, Marcus and Lewis (2003) highlighted a study of 610 community volunteers in a six-week intervention program using the stages of change model. They found that by targeting participants at their assessed level in the stages of change they were able to effectively move them to take action. Thirty percent of those assessed to be in contemplation stage and 61 percent of those assessed to be in the preparation stage were moved into the action stage. Another 31 percent of those in the contemplation stage were able to be moved into the preparation stage. In a similar study conducted in a worksite program Marcus and her colleagues found that on average people in the targeted groups move one stage more than those placed in standard self-help groups (cited in Marcus & Lewis, 2003).

By using the stages of change model with overweight subjects to help manage healthy weight Sarkin, Johnson, Prochaska, and Prochaska (2001) were able to observe two important variables among their participants. The first is that precontemplators are able to identify far more cons for physical activity than pros. This imbalance is greatly reduced for people in the contemplation stage and is reversed with those in the preparation stage. This indicates that through targeted interventions with educational materials, practitioners may be able to move clients through the earlier stages of change. Their data also showed a decrease in the number of pros and cons identified by participants in the action and maintenance stage, which they suggest showed that people who have become active operate more from automatic behaviors toward exercise than those in the earlier stages of change. If this is true, practitioners who are able to move their

clients into the action or maintenance stage are more likely to facilitate the adoption of regular exercise.

The second observed variable was that as people move through the stages, they significantly increase their self-efficacy. This indicates that self-efficacy creates an increased desire and intention to remain physically active.

<div align="center">MANAGEMENT IMPLICATIONS</div>

Research has demonstrated the effectiveness of Prochaska and Marcus (1994) Transtheoretical Model and Prochaska and DiClemente (1983) stages of change model to effect behavior modifications toward adoption and maintenance of regular exercise (Mullan, Markland & Ingledew, 1997; Dunlop & Berry, 2002; Perri, Anton, Durning, Ketterson, & Sydeman, 2002; Marcus & Lewis, 2003; Ingledew, Markland, & Sheppard, 2004). By assessing an individual's readiness to change and tailor intervention programs that increase a person's self-efficacy, self-determination, competence, and sense of fulfillment it is feasible that practitioners can move their clients toward becoming intrinsically motivated exercisers.

Tailoring programs for each individual's situation is a time consuming process, but necessary due to the fact that not all participants will be at the same place in their journey toward health. In their work for the Presidential Council on Physical Fitness and Sports, Marcus and Lewis (2003) give guidance to health providers on what may be required for people in different stages of their exercise development. It's through the use of the stages of change model that managers can help individuals move through each stage toward adopting and maintaining new knowledge and habits.

For the most part the management implications of the theories and research reviewed would apply regardless of the setting. However, for the purpose of this paper, the management

implications will be tailored for the fitness programs of the United States Air Force. The

identification of this particular structure will allow for greater specificity of the implications.

Precontemplators – It would be a rare case that someone in the Air Force would be able to go

without thinking about exercise for even a short period of time. All military personnel are

required to maintain their fitness for the purpose of operational readiness, which requires them to

be ready to deploy on short notice to sometimes austere environments. Each Air Force unit is

also required to manage a unit level fitness program which offer varying fitness and exercise

activities. However, because the Air Force is also comprised of civil service workers,

contractors, and family members that aren't required to exercise but effect the overall operation

of the military, it is important to not skip the earlier stages of change.

Therefore, for people who haven't even considered an exercise program, Marcus and Lewis

(2003) suggest providing educational materials to them on the benefits of being active, such as

reduced risk of heart disease, lower cholesterol and stress levels, and boosts in energy. Although

this information may tie into extrinsic motivators it will also increase the person's ability to

make self-determined decisions based on their gained knowledge. Information that challenges

the anticipated negative aspects of being more active should be provided for precomtemplators to

consider or review, this could dispel some perceived barriers with plausible interventions even

before they begin to think about exercising. The ability to foresee barriers and acquire the

expectations of overcoming or avoiding them will serve to boost a person's self-efficacy to

maintain adherence in the later stages of change (Marcus & Lewis, 2003). Publicized

information should include reminders that everyday activities such as gardening, walking the dog

through the park, playing with family members, and cleaning the house can be beneficial if done

with moderate intensity and can be enjoyable. When the thought of being active isn't even being

entertained, simply planting the seeds for the idea to grow is an important step in the right direction. Be aware that precontemplators are most resistant to change and may see no reason to expend any effort to change. To force exercise regimens upon precontemplators may result in participation, but would likely be met with resistance and resentment. It is important to acknowledge the resistance, yet follow-up with additional salient information, that they may evaluate as they begin to think about making a change.

To enhance the possibility of moving people from precontemplation to contemplation practitioners can administer the follow interventions relevant to the corresponding constructs:

SELF-EFFICACY

- Because people in the precontemplation stage aren't exercising yet practitioners are unable to work on skill building. It is more important to focus on building their knowledge of the benefits derived from exercise.

- Use base newspaper and bulletin articles to help people remember the enjoyment of physical activities they've participated in before.

- Publicize articles that review exercise research findings that show similar groups of people who have been successful in achieving short-term health related goals.

- Express confidence in family members and civilian personnel to make positive changes that can enhance the readiness and ability of the military to take care of the mission.

- Use success stories to motivate others to begin thinking of taking up healthier habits.

SELF-DETERMINATION

- Base Fitness Program Managers can use local television broadcasts to inform base personnel of special events and regularly scheduled classes offered on base and in the local community geared toward increasing fitness.

- Retail outlets on base (Base Exchange, Commissary, food outlets) could be used to advertise the benefits of living a healthy lifestyle by providing positive educational information.

- Distribute information that dispels the most common barriers to exercise and aggressively advertise the schedules of the many exercise and fitness classes offered on base.

- Through advertising acknowledge that some people many not be ready to begin an exercise program and provide information regarding the many professionals at the Fitness Center, Health and Wellness Center, and Hospital that they can talk to when they're ready.

- Distributed information should always acknowledge individual's ability to control the decision making process.

- Base newspaper can publish articles that introduce values associated with exercise and highlight people who have integrated those values into their daily life.

- Explore incentives that won't interfere with developing intrinsic motivation for exercise.

RELATEDNESS

- Outdoor Recreation can target squadrons to participate in challenging trips or instructional courses by providing discounts for unit personnel that sign up as a group.

- Publicize follow up stories of 5K fun runs and Corporate Challenge events that highlight the camaraderie of working to improve the fitness of the entire Air Force team.

- Because most people who work on base live off base, information should be provided on how to become involved in events sponsored by local parks and recreation departments.

- Highlight people's positive experiences on physically challenging outdoor recreation trips. Use human interest type stories that will help people relate to those who participate in adventurous activities.

- Create incentives for people who bring their friends or family members to workout on a regular basis.

Contemplators – As with the precontemplation stage it is unusual for Air Force members to be in the contemplation stage because of the institutional requirement placed upon them by the formal fitness programs. However, there is a phenomenon in the Air Force; that occurs when someone passes their fitness assessment test but remains sedentary until the following years test. Members that operate in this way may find themselves in a constant state of contemplation. They know the requirement to test is present, but haven't internalized the values associated with maintaining their health for the good of the organization. It's important to address this stage of change because of the significant impact non-military members (families, civil service workers, contractors, etc.) have on military operations. It is also important to consider because of the role non-military members can play in supporting the military members to maintain their fitness. The more educated the support structure is about the benefits of exercise the more influence they may exert.

Contemplators have absorbed enough positive information that they are beginning actively to weight the pros and cons of physical activity. Adding information on the ill effects of not changing will help to tip the scales towards preparing them to take action. Contemplators, and members of the Air Force who transfer to unfamiliar locations, will also begin to judge whether changes are plausible within their environment and social setting, if the available facilities are accessible, and if programs they would enjoy are offered. Once a person begins to think about

becoming active, Marcus and Lewis (2003) recommend that the interventions for precontemplators be reinforced to strengthen the learning process and answer questions to clarify any misunderstandings. Additional information should be provided concerning perceived barriers to dispel misconceptions. This can help minimize unwarranted anxieties and develop a better sense of self-efficacy to overcome certain barriers. Information on how to incorporate physical activity into a daily routine can help people realize that minimal changes can have health benefits. This may allow contemplators to begin a routine of activity without initial overload. Educate them that more frequent walks of medium intensity have proven to help others stick to an exercise plan longer and engage in a greater amount of exercise (Perri, Anton, Durning, Ketterson, & Sydeman, 2002). Help contemplators look beyond traditional means of exercise by providing alternative fitness resources that are available such as mall walking, using stairs as opposed to elevators for short bouts of interval training, and exercise video tapes that can be checked out from base or local libraries for use in the privacy of their own home. Being open to new ideas and reevaluating daily routines can add a fair amount of activity to someone's day.

To enhance the possibility of moving people from contemplation to preparation practitioners can administer the follow interventions relevant to the corresponding constructs:

SELF-EFFICACY

- Reinforce that there are fitness programs tailored to everyone's their skill level. Competence levels should still be assessed, because prior failures have prepared them for future successes.

- Tailor fitness class schedules to meet the demands of targeted groups. Stay at home spouses may be available after their children get off to school, and high tempo work centers may require early morning or late evening workouts classes.

- Provide daycare facilities or family workout rooms that keep children safe while allowing parents the opportunity to get their workouts in.

- Fitness Centers can advertise through senior leader staff meetings a willingness to alter aerobic class schedules to suit individual squadron's needs.

- Senior leadership can announce their commitment and confidence in people to work toward a balance of taking care of the mission and taking care of themselves.

SELF-DETERMINATION

- Use base newspaper articles to increase people's knowledge about the pros and cons of active or sedentary lifestyles, which may help tip their decisional balance toward exercise

- Market the fun and enjoyment that can be derived from being actively involved.

- Significant people in a sedentary person's life should reaffirm the control they possess and making decisions that will benefit them and others in their life.

- Fitness Centers can offer a wide variety of aerobic and strength training classes that will allow people the freedom to choose activities that they enjoy.

- Once a person begins to think about making changes elicit a commitment from them to make a plan that will allow them to succeed, and validate their desire to make a change.

- Outdoor recreation can work with the Fitness Center and Health and Wellness Center to develop fitness programs that will increase a person's ability to enjoy their activities.

- Education programs can assist people to integrate social values associated with maintaining their physical fitness through the benefits of exercise.

- Fitness instructors can find ways to discuss various motives associated with exercise and highlight those that have been found to help people maintain adherence and enjoyment.

- Fitness Directors can develop incentive programs geared toward helping people become active, without interfering with future goals of remaining physically fit.

RELATEDNESS

- In marketing to contemplators there should be a two pronged approach. The first is to focus on the camaraderie among military personnel at all levels of the organization, and second is on family fitness that will develop or enhance the support systems of the troops.

- Fitness Centers and Health and Wellness Centers can develop programs to target groups of spouses and civilian workers who have similar interest and weekly schedules.

- "Support the Force" programs can provide spouses information about how their healthful choices in their homes can positively affect the military member's health and readiness.

- Ensure base agencies provide an open invitation to support and assist family members and civilian worker in their search to find fitness venues in the local area.

Preparers – At this stage the focus of interventions will move toward active duty Air Force members. Air Force members who work in high tempo careers or have faced physical injuries may not be able to participate in regular physical activities. Air Force members who travel often or deploy to unfamiliar locations may experience a break in their exercise routines. Each of these groups will need to reevaluate what facilities and programs are available for them to begin or continue their workouts. These members may find themselves in a type of forced relapse where they'll need to develop new routines to maintain their fitness and ability to pass the Air Force fitness assessment test.

By developing plans and exercise schedules a preparer imposes personal control over the changes they are making. It's at this stage that a person may face perceived constraints such as not having enough time in which to pursue a new routine or having to overcome the temptation to fall back into sedentary habits. Helping them evaluate each constraint and implementing coping skills will give them a greater sense of control over each situation and increase their self-efficacy to adapt in the face of adversity. It's in this stage that activity may begin. Preparers should be encouraged to choose enjoyable activities that can be worked into their schedule, and develop a plan that includes realistic short-term goals.

To enhance the possibility of moving people from preparation to action practitioners can administer the following interventions relevant to the corresponding constructs:

SELF-EFFICACY

- Fitness staff members should be knowledgeable about the many activities offered on base and trained to help people develop exercise programs and routines.

- Outdoor Recreation can host a series of "How To" classes that introduce people to local recreation venues and equipment sources.

- Public Affairs offices can run success stories in base newspapers that highlight people who've overcome the adversity of long work hours, family obligations, and deployments.

- Health and Wellness Centers can produce exercise pamphlets to teach people proper form and safety aspects of strength, endurance, and flexibility training.

- Use fitness articles in the base newspaper that feature barriers to fitness programs people have expressed and offer workable solutions that enhance people's ability to participate.

- Unit Fitness Program Managers can provide information through e-mail channels that teach strategies to overcome barriers to exercise routines or fitness activities.

SELF-DETERMINATION

- Unit commanders can help increase their member's self-determination by allowing them to choose activities and schedules that best suit their work and fitness schedules.

- Supervisors should validate their subordinate's commitment to change by coordinating work schedules with them that allots time for workouts when the mission allows. This will also acknowledge the individual's control over planning their desired changes.

- Physical Training Leaders can help members identify short-term and long-term goals, and develop exercise plans that will safely allow them to achieve those goals.

- Base Fitness Program Managers can publish generic guides that help prepare people for the Air Forces Physical Fitness Assessment.

- The Health and Wellness Center staffs can use their educational classes to help members explore individual's values they have toward exercise programs and being healthy.

- Course materials can introduce the theory of Flow and describing how individuals can derive pleasures from challenging themselves with hard work that increases their skills.

- Deployment locations can greet incoming personnel with an orientation on fitness opportunities and programs that will use their time wisely and keep them entertained.

RELATEDNESS

- Commanders can emphasize an individual's responsibility to maintain their fitness in order to maximize their contributions to the overall Air Force mission.

- Supervisors and work center managers can arrange time for work groups to exercise together making fitness a part of the formal work schedule and emphasize the importance of staying physically fit for the good of their team, squadron and Air Force.

- Support people's decision to make a change with approval, praise and encouragement.

- Unit Physical Fitness Leaders can help match up workout partners, using more skilled and able individuals to work with people who are attempting to improve their abilities.

- Using the "families that play together stay together" principle, Fitness Centers can develop family programs that involve both parents and children in the activities.

Active – Because the Air Force tests its member's health on a recurring basis and requires active duty members to participate in structured exercise programs, it is assumed that the majority of the force is either in the action or maintenance stages of change. However there are many aspects of military life that could interfere with exercise and fitness plans. Discussing these situations with commanders, supervisors, and individuals can help them work together to develop strategies for overcoming perceived barriers which can remove someone from their exercise routine. Particularly important are times of stress. If people are aware of the stress relieving benefits of exercise and its ability to increase their energy they will be more likely to prioritize exercise into their hectic schedules.

Commanders and everyone involved in the fitness management programs can continue to build their peoples' self-efficacy by praising the efforts they've put into making lasting changes. This can help reaffirm their commitment to fitness as a good decision for themselves, their unit, and the greater good of the Air Force.

To avoid injury and foster skill building encourage them to start slowly and gradually increase the number of times they are active and the duration of time they spend being active. Again, provide recognition for their continued participation and additional skills development which can improve their self-efficacy and motivation. Also praise them for their effort and openness to new ideas and learning new skills.

To enhance the possibility of moving clients from action to maintenance practitioners can administer the following interventions relevant to the corresponding constructs:

SELF-EFFICACY

- Continually explore new exercise programs that teach people the basics of getting active.

- Market introductory classes that help people build solid skills so they'll be able to mastery simple moves or exercises before encountering more difficult routines.

- Market exercise classes that emphasize mastery, ensure instructors take the time to teach at every class and offer individual attention to those that are just beginning a program.

- Fitness classes should be geared toward early successes through focusing on the development of mastery skills. Each activity should host an introductory class.

- Unit Physical Training Leaders can provide exercise logs to track cardiovascular and strength training workouts that give individuals the ability to monitor their progress.

- Base Commanders can host installation sports days that allow members to participate in events in which they feel most able to succeed.

- Intramural sports programs can emphasize skill building goals and host pre-season clinics that teach exercise routines that can enhance their performance and reduce injuries.

- Fitness programs can promote the use of personal monitoring tools such as exercise logs and daily nutritional diaries that help people track their progress toward identified goals.

- Fitness Centers can offer intermediate level training courses that build participant's fitness knowledge and skills for desired exercise formats.

- Course instructors can be encouraged to continually monitor class participants' skills and abilities and provide constructive feedback when appropriate.

- Unit Physical Fitness Leaders can use training sessions to discuss barriers or constraints their unit members may experience and provide workable solutions. Commanders may need to get involved if supervisors aren't able to provide subordinates time to workout.

- If barriers are found to be a serious hindrance, individuals can be referred to the Life Skills office for time-management and stress-management course that can improve their ability to effectively schedule their time and strengthen their coping strategies

- Recognition programs can be developed for most improved members in a unit where awards are presented during Commander's Call assemblies.

SELF-DETERMINATION

- Members can use established tracking tools to develop personal plans toward maintaining fitness routines, in doing so they'll take responsibility and credit for their own success.

- Fitness Centers and Health and Wellness Centers can host goal setting classes and provide participants with a choice of tailored plans to help them reach their goals.

- Physical Training Leader can incorporate a fun activity into each workout session such as games of Ultimate Frisbee, Cardio Boot Camp, or Ultimate Circuit training.

- Fitness class leaders can help people develop a sense of Flow and encourage them to get lost in the activity by concentrating on certain aspects of the exercise or their movements.

- Instructors can discuss what people value about attending each class and help them move toward internalizing intrinsic values for exercise and maintenance of a healthy lifestyle.

- Instructors can discuss what rewards people realize from their participation and suggest they use some exercise sessions to simply focus on the fun of the experience.

RELATEDNESS

- Fitness Centers can develop running, cycling, swimming and other activity clubs that help join people together who have similar interests and build information systems that keep them informed of events or opportunities in the local area and travel destinations.

- Bases can support sports team that participate in local parks and recreation leagues, which will build camaraderie on the base and serve as a public liaison venue to the city.

- Commanders can publicly recognize significant achievements in improved fitness levels with team spirit awards for maintaining the integrity of the Air Force team.

- Family activities can be programmed that will allow members to integrate their fitness program into their home life.

Maintainers – Ideally all Air Force members should be in the maintenance stage. However, in the mission oriented structure of the Air Force people sometimes feel that after their long work days they don't have the energy to exercise. These military members need to be periodically reminded that staying active can lead to increased energy levels (Marcus & Lewis, 2003).

Members' success should be celebrated and rewarded to help them reinforce the belief that the journey they've completed is worth the result and benefits. Commanders can help reinforce that their success is a positive indicator of their commitment to the mission of the Air Force and their ability to maintain their readiness in the future.

Practitioners should be wary not to lose contact with individuals who reach a level of continual exercise. Continued support and the introduction of new health and wellness material can sustain a person's interest and focus on maintaining their personal well being.

To decrease the likelihood of relapse practitioners can administer the following interventions relevant to the corresponding constructs:

SELF-EFFICACY

- Physical Fitness Leaders can introduce cross-training events into their unit's fitness program that will teach people new skills and challenge previously learned skills.

- Commanders may not believe that maintainers require a boost in self-efficacy, but should confirm their peoples' ability to plan and use their skills to make a positive impact on the mission of the unit and provide critical support to much larger Air Force initiatives.

- Commanders can also celebrate their peoples' fitness successes with public recognition, emphasizing the significance of their efforts and how they are valued as role models.

- Outdoor Recreation can market adventure activities that will use skills military members train to maintain (cardiovascular, strength, flexibility and endurance).

- Outdoor Recreation can coordinate Corporate Challenge event teams that allow people to use their skills in new activities and competing with people from the local community.

- Fitness Centers can keep people informed about the annual Air Force Marathon and provide training plans that will prepare them for such major events.

- Physical Fitness Leaders can discuss how elite athletes maintain the enjoyment of their sport by continually pushing to reach new goals and learn more about themselves.

- Fitness Centers can encourage people to move from being participants to becoming instructors for fitness programs by offer courses that will certify personal trainers.

- Fitness Centers can use some of their workout sessions to review the basic principles of each particular exercise format, emphasizing safety and proper form to avoid injury.

- Physical Fitness Managers can use people who have mastered activities to help teach unit fitness sessions, which will increase their skills and understanding of the activity.

- Base newspapers can publish articles that review coping strategies to maintain routines for people who travel frequently, deploy to remote location, or experience a relapse.

SELF-DETERMINATION

- Unit Fitness Program Managers can help members evaluate the goals that enable them maintain a regular fitness routine, and reassess those goals into one's to keep them active.

- Fitness Centers can adjust hours of operation to support their base during base-wide military training events.

- Fitness Centers can gather information about deployed locations fitness opportunities and provide it to deploying troops with suggested training activities tailored to each location.

- Base newspapers can publish articles thanking those who have chosen to maintain a healthy lifestyle and highlight some of their accomplishment that the Air Force made possible through allocated resources and the expertise of the fitness management staff.

- Base newspapers can publish articles that explain the negative effects of relapse periods on a person's health (quick muscle and endurance lose).

- Base newspapers can publish articles that highlight positive values and military reasons for keeping oneself in top physical condition, and how those values affect the mission.

- Base Fitness Program Managers can emphasize how the enjoyment of an activity is what keeps a person interested and how increasing one's skills can improve their enjoyment.

- Remind participants that muscle and endurance are lost twice as fast as they are gained and maintaining a regular exercise routine is the only way to sustain their improvements.

RELATEDNESS

- Commander can assure members that they're supported in their pursuit to maintain their personal fitness, by highlighting the fitness management structure the Air Force has developed for them and their family members.

- Unit Fitness Program Managers can help individuals connect with activity clubs or associations that focus on their unique physical activity interests.

- Base newspapers can support activity clubs and associations by providing free event schedules and workshop advertisements.

- Members who have learned new skills should be encouraged to support others by participate in fitness activities with their coworkers, friends, and families.

Suggestions for Future Research

Although an abundance of research exists on the motivation to exercise it is so diverse and multifaceted that there are a myriad of relationships that remain to be studied. A study of the relationship between a person's stage of change and their orientation along the continuum of motivation could determine whether moving them through the stages increases their intrinsic motivation. For example, if a person who in the precontemplation stage and also amotivated was able to be move into the preparation stage, would they also move from amotivation to external regulation or introjected regulation types of extrinsic motivation? If a relationship exists between a person's motivation level and their stage change, it would be more beneficial for practitioners to simultaneously move a person through the stages of change while helping them become more self-determined in their exercise program.

Flow experiences are another untapped resource towards developing intrinsic motivation. Although the theory suggests that the state of flow is, in and of itself, an intrinsic experience,

could mini-flow experiences in low skill activities increase a persons desire to become more skilled and thus take on greater physical challenges. A study to examine mini-flow experiences might identify low impact and moderately challenging activities which could be the impetus that gets people involved in an activity. It may also enable practitioner to program entry level or beginner courses that could be used as enablers for the most sedentary people.

From a practitioner's standpoint there is a need for a comprehensive instrument (survey or questionnaire) that can assess a person's self-efficacy, motivation, self-determination, competence, and relatedness. Such an instrument should be easy to administer and interpret within the time constraints and context of a fitness facility, and would greatly improve the practitioner's ability to effectively tailor their interventions to each particular client.

CONCLUSION

Increasing American citizens' motivation toward physical activity is important to enhancing the well-being of the nation. By increasing the amount of physical activity and exercise in which people engage there is the potential to provide vast benefits to our nation in the areas of its economy, health, and quality of life. Researchers have determined both the constructs and relative framework on which practitioners can develop effective programs that will enable individuals to exercise freedom of choice, enjoy the improvement of their competencies, and within which they can develop new friendships. By using the theories of Self-Determination (Deci & Ryan, 1980), Cognitive Evaluation (Deci & Ryan, 1985), Self-Efficacy (Bandura, 1997), and Flow (Csikszentmihalyi, 1990) and the Transtheoretical model (Prochaska & DiClemente, 1983; Prochaska & Marcus, 1994) research has shown people can make positive changes.

The information provided here poses an immediate challenge to leisure service practitioners. Purveyors of physical activity and exercise programs should assess their offerings, employees, and environment to ensure they have developed climates that are mastery oriented. They should limit their use of controls to only those that encourage initiation into an activity, which they have the ability to replace with intrinsic rewards. Group activities should encourage a sense of cooperative involvement to increase participant's feeling of relatedness. Most importantly clients should always be encouraged to choose what they do. In providing such environments, fitness practitioners can begin to assist in the recovery of a nation from its current sedentary state and its pending state of disease and despair.

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